

Draft

# Test Build, Load & Activation Phase 1 Thread Assessment

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Version 1.1

Draft

# Test Build, Load & Activation Phase 1 Thread

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## 1. Introduction

### 1.1 Test Build, Load & Activation Phase 1 Thread Overview.

Test Build, Load & Activation will provide the following capabilities for Redstone:

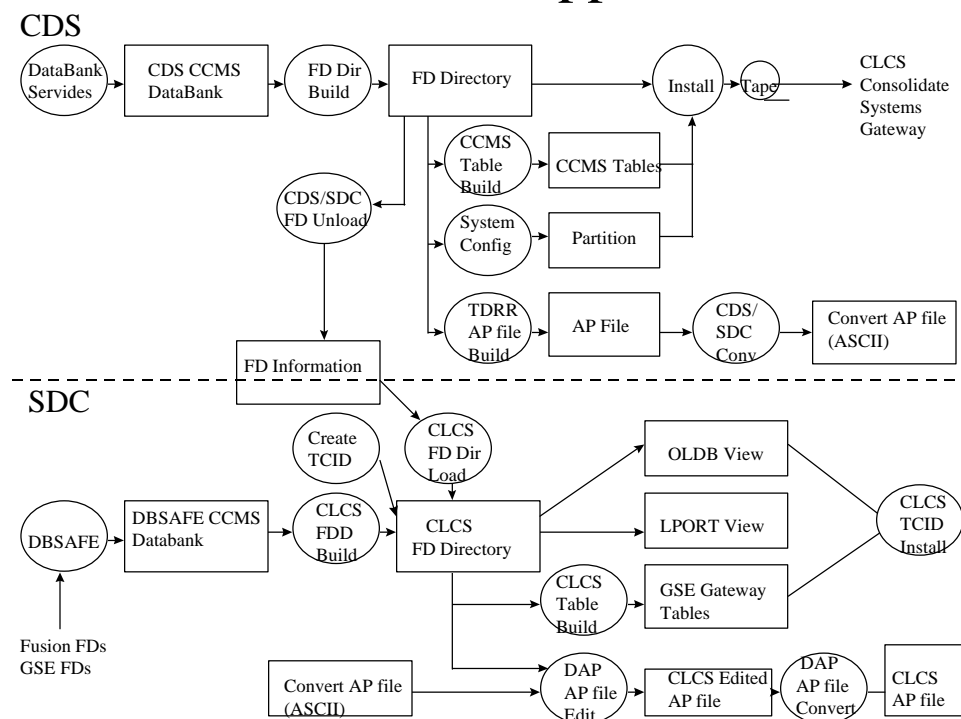
- TCID Build products required to support Redstone demonstration capabilities
- The ability to load a Target CLCS Set with required TCID Build products and application products
- The ability to bring a Target CLCS Set to an active state

### 1.2 Test Build, Load & Activation Phase 1 Thread Concept

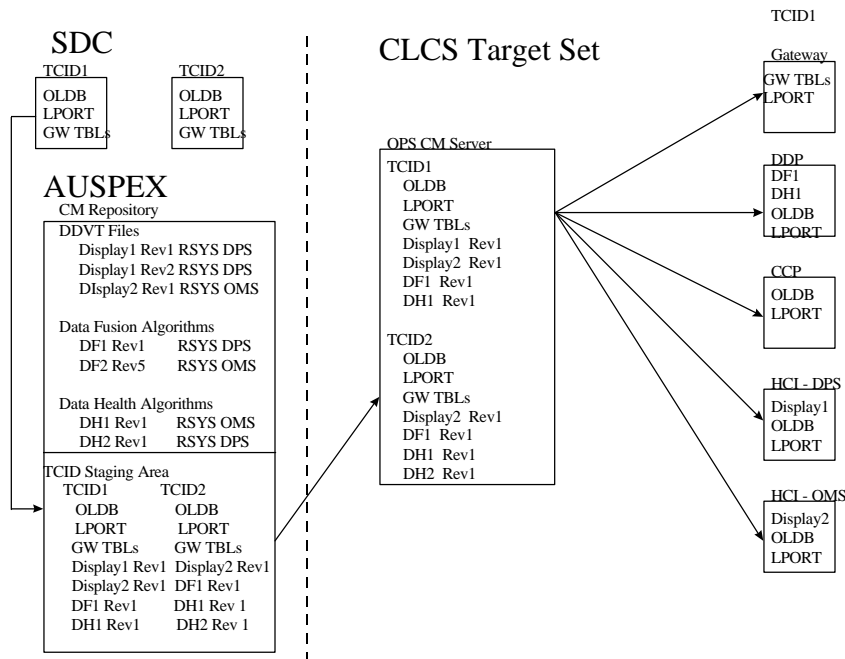
To support the Redstone Demonstration capabilities of SLWT monitoring and Application Debug Configuration, the following capabilities will be developed:

- Databank will be modified to support Fusion Function Designators(FDs)
- CLCS FD Directory (FDD) will merge CCMS-1 FDD information with new CLCS information
- Produce OLDB, TCID Descriptor and LPORT files
- Build Gateway Tables required for GSE Gateways
- Provide the capability to load a CLCS Set with the following files:
  - Gateway Tables
  - TCID Descriptor
  - Online Databank
  - LPORT Table (for routing information)
  - DDVT files
  - Data Fusion Algorithms
  - Data Health Algorithms
- Provide the capability to bring a CLCS Set to an active state.

## TCID Build Flow to support Redstone Delivery



# Draft TCID Load Flow to support Redstone Delivery



## 1.3 Test Build, Load & Activation Phase 1 Thread Specification

- Determine whether Test Build should produce memory image tables or an interim form from which memory image tables are created at CLCS Subsystem load/initialization.
- Integrate Test Build & Load services with the CLCS Development Environment and the SDC.
- Provide GW Tables.
- Provide the Online Data Bank Table.
- Provide a Function Designator Directory Table.
- Provide user application files organized by responsible system.
- Provide an initial capability to load and activate a Test Build onto a CLCS Set.

## 1.4 Test Build, Load & Activation Phase 1 Thread Assessment Summary

1. Determine whether Test Build should produce memory image tables or an interim form from which memory image tables are created at CLCS Subsystem load/initialization.
  - GW Tables will be built and stored in an Oracle structure. These tables will be like the tables loaded into the Gateway. This is necessary because of the amount of de-conflicting that the table build software performs.
2. Integrate Test Build & Load service with the CLCS Development Environment and the SDC.
  - For Redstone, it has been determined that a staging area will be set up on the AUSPEX in the CM Repository for TCIDs. All files needed to be loaded on a target CLCS Set will be put in the staging area and OPS CM will copy the TCID files from there. The effort to perform this task is assessed as part of the Set Build & Load Phase 1 Thread (CLCS Development Environment CSCI).
3. Provide GW Tables.
  - The TCID Build and Control CSCI will provide the necessary tables to support the GSE Gateway. It is estimated that this effort will take 3.6 manmonths to complete.
4. Provide Online Data Bank Table.
  - See next item.
5. Provide Function Designator Directory
  - This item will affect the following CSCI's

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- The DBSAFE CSCI will need to be modified as applicable to support Fusion FDs and GSE FDs for CLCS. It is estimated that this effort will take 3.6 manmonths.
  - The TCID Build and Control CSCI will need to create software to perform the following tasks: (10.9 manmonths total)
    - Unload FD data from CDS - 1 manmonth
    - Create CLCS TCID - 1.2 manmonths
    - CLCS FD Directory Load - 2.7 manmonths
    - CLCS FD Directory Build (Fusion and GSE FDs) - 6 manmonths
    - CLCS TCID Installation - 1.5 manmonths
  - This item will also affect the Consolidated Systems Gateway since the CLCS FD Directory will contain new FDIDs.
  - The Data Retrieval CSCI will have to create the CLCS AP file - 3 manmonths.
  - Simulation Gateway CSCI may be impacted by this thread. It is currently envisioned that data will be provided to the Simulation System using the same philosophy being used to support the SGOS Replatform effort. However, if the data fields in the Function Designator Directory change, this CSCI will need to change the same fields.
6. Provide user application files organized by responsible system
- This item affects the CLCS Development Environment which has not yet determine the tool which should be used for the CM Repository. This is one of the requirements which should be evaluated as part of the tool selection - provide the capability in the CM Repository to tie user application files to a responsible system. If as part of the CM Tool Selection, it is not possible for the CM Tool to perform this function, this requirement will be readdressed. This is a TBD impact to the CLCS Development Environment CSCI.
7. Provide capability to load and activate a Test Build onto a CLCS Set.
- The System Control CSCI will be responsible for this task. It will load the necessary TCID files from the TCID Staging Area in the CM Repository to the CLCS Set.
  - After the required files have been loaded, the System Control CSCI will get the CLCS Set to an active state.
  - This effort is estimated to take 24 manmonths.
  - System Control CSCI will utilize services from System Services CSCI to initialize software. This is an estimated 6 manmonth impact.

### 1.5 Test Build, Load & Activation Phase 1 Thread Hardware Diagram

N/A.

### 1.6 Test Build, Load & Activation Phase 1 Thread Deliverables

1. Each CSCI will deliver source and object code as applicable.
2. User Guides will be supplied where applicable.
3. Software Requirements and Design will be provided where applicable.

### 1.7 Test Build, Load & Activation Phase 1 Thread Schedule

See attached schedule.

### 1.8 Test Build, Load & Activation Phase 1 Thread Simulation Requirements

N/A.

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### 1.9 Test Build, Load & Activation Phase 1 Thread Training Requirements

Initial training will be provided for loading and activating the set.

### 1.10 Test Build, Load & Activation Phase 1 Thread System Test Requirements

The System Test Requirements for this thread will entail performing the following steps:

1. The FD Data will be unloaded from CDS.
2. A CLCS TCID will be created on SDC.
3. The FD Data from CDS will be loaded into the CLCS TCID.
4. Some Fusion and GSE FDs will be loaded into the DBSAFE Databank.
5. The fusion and GSE FDs will be included in the CLCS TCID.
6. GSE Gateway Tables will be built.
7. The CLCS TCID Install function will be exercised to install data into the TCID Staging area on the Auspex.
8. The CM Server and the target CLCS Set will then be loaded with this TCID.
9. The Set will be activated.

### 1.11 Test Build, Load & Activation Phase 1 Thread Facilities Requirements

N/A

### 1.12 Test Build, Load & Activation Phase 1 Thread Procurement

To support these efforts, it will be necessary to procure and applications server for LSDN and additional disk space on SDC to contain these new database instances. USA will be responsible for procuring this equipment.

### 1.13 Test Build, Load & Activation Phase 1 Thread Dependencies

- DDVT files, Data Health Algorithms, and Data Fusion Algorithms are required to be supplied by the Super Lightweight Tank Display CSCI.
- The DDVT files, Data Health Algorithms, and Data Fusion Algorithms will be stored in the CM Repository and tagged appropriately.
- CM Repository with TCID Staging Area Defined.

### 1.14 Test Build, Load & Activation Phase 1 Thread Action Items/Resolution

1. An action item needs to be assigned to SE&I to investigate the best method of assigning FDIDs. The main issue is whether these numbers can be assigned and stored in the DBSAFE databank or if they should be assigned at build time. Also, should the FDID addressing follow any particular scheme (e.g. ranges of FDIDs by type, by CPU, or should there be no intelligence in this scheme - it's just a sequential number).
2. The Test Build products on SDC (DEC Alpha) are Little Endian and the CLCS (SGI & AUSPEX) is Big Endian. Who is responsible for the conversion and how will it be done.
3. For Redstone, are the application software loads supposed to be handled by RSYS?
4. Will the payload packet format be 16-bit as in Juno or variable length coming out of the Consolidated Systems Gateway.
5. How is calibration going to be handled? What will be output from the Consolidated Systems Gateway vs. The GSE Gateway?
6. A draft definition needs to be developed for the OLDB.

## 2. CI Assessments

### 2.1 DBSAFE Assessment

Fusion FDs and GSE FDs are required to be included in DBSAFE to support the demonstration capabilities of this release. Fusion FDs and GSE FDs will be loaded in the DBSAFE databank to support CLCS FD Directory Build.

#### DBSAFE Work Required

A separate CLCS baseline of DBSAFE will be established. New database instances will be created to contain the DBSAFE CLCS tablespace. The CLCS version of DBSAFE will be modified to support the definition of Fusion FDs. Code unique to CCMS that is not required for CLCS will be eliminated. The FD Directory Build input parameters, including Responsible System (RSYS) definitions, will be generated by DBSAFE.

#### CSCI Assessment

Function Name	CSCI Labor (EP)	% of CSCI	Function EP
DBSAFE	3.6 manmonth		

#### Lines of Code

TBD

#### Documentation

TBD

#### Assumptions

DBSAFE forms will use the 4.0 release of Oracle Forms.

Fusion FDs will be restricted to currently supported data types (e.g. analog, discrete, digital pattern).

Operational responsibilities for generation of the products will belong to USA LPS S/W Integration Department.

#### Open Issues

The impacts of Fusion FD levels have not been addressed. The requirements to support the levels in the DBSAFE databank are unknown at this time.

### 2.2 TCID Build and Control Assessment

In support of the Redstone Delivery capabilities, the TCID Build and Control CSCI will provide the tables necessary to support the SLWT Monitoring and the Application Debug Configuration. Because the Consolidated Systems Gateway outputs information derived from the Shuttle Data Stream, Metro Data, and GMS Data which has been incorporated into the CDS TCID Build process, it is necessary to include that data into the Online Data Bank (OLDB) to support the desires to monitor this data in the SLWT Monitoring Demo. The CDS/CLCS FD Unload and CLCS FD Directory Load functions are being developed to support this capability. However, additional data is required to support the Fusion FD Capability. Because of existing constraints in CDS/CCMS, it is not suggested that the Fusion FDs attempt to be merged into CDS like was performed for the Metro and GMS data to support Juno. Instead, it is suggested that the Fusion FDs be incorporated into the DBSAFE Databank on

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SDC. This will require a CLCS FD Directory function be developed to allow these Fused FDs to be included in the Function Designator Directory along with the FDs being loaded from CDS. At the same time, in order to position ourselves to be able to support HMF, an option is being considered to also add the required GSE FDs to the DBSAFE databank. This will allow us the flexibility of taking existing FDs from CDS or from DBSAFE to support the GSE Link Support Phase 1 Thread and the User Commanding Phase 1 Thread. CLCS GSE Gateway Tables will be built from the CLCS FD Directory (regardless of where the data in the FD Directory comes from). The necessary TCID files (OLDB, LPORT, TCID Descriptor, and Gateway Tables) along with the applicable application software files (DDVT files, Data Health Algorithms, and Data Fusion Algorithms) will be transferred to the TCID Staging Area of the CM Repository by the CLCS Installation Function.

### **CDS/CLCS FD Unload Work Required**

The CDS/CLCS FD Unload process will be developed to extract FD information from the CDS FD Directory and convert data from BCD to ASCII. This process can be developed from existing CDS software.

### **CLCS Create TCID Work Required**

A CLCS Create TCID process will be developed to create CLCS TCID database tables. Tables will be generated for a CLCS FD Directory, the CLCS Gateway, and other tables as required. New database instances will be created to contain these tablespaces.

### **CLCS FD Directory Load Work Required**

The CLCS FD Directory Load process will be developed to:

1. convert CDS FD information into CLCS compatible form (scaling, coefficients, buffer length, etc.)
2. replace CDBFR address with a RTCN FDID
3. load modified FD information into the CLCS FD Directory Tables
4. load FD information will be performed on a CPU name basis to support edits which may occur to the CDS TCIDs.

### **CLCS FD Directory Build Work Required**

CLCS FD Directory Build will process FD information in the DBSAFE CLCS Databank to populate the CLCS FD Directory with FD information. A capability to rebuild information for a specific CPU will be provided. Input parameters (VCNs, RSYS, etc.) will be acquired from DBSAFE. The FD Directory Build process will:

1. validate data in the CLCS Databank against the selection criteria (VCN's, RSYS, etc.)
2. assign RTCN FDID to each FD
3. generate FD directory entries for GSE FDs
4. generate FD directory entries for Fusion FDs
5. create an Online Databank view
6. create an LPORT/CPU view

Specific processing requirements will be determined upon review of current GSE processing in the CDS FD Directory Build Software.

### **CLCS TCID Installation Work Required**

The TCID files produced on SDC will need to be transferred to the CM Repository (AUSPEX for Redstone) to the TCID Staging Area. Then, the appropriate application software files required to support this TCID will be included in the staging area to support the load activity.

### **CLCS Gateway Table Build Work Required**

CLCS Gateway Table Build will process FD information in the CLCS FD Directory to generate the descriptor tables and polling tables. Processing will be limited to specific CPUs via user input parameters supplied via the user interface.

### **CSCI Assessment**



## Draft

Function Name	CSCI Labor (EP)	% of CSCI	Function EP
CDS/CLCS FD Unload	1 manmonth		
CLCS Create TCID	1.2 manmonth		
CLCS FD Directory Load	2.7 manmonth		
CLCS FD Directory Build	6 manmonth		
CLCS Gateway Table Build	3.6 manmonth		
CLCS TCID Installation	1.5 manmonth		

### Lines of Code

TBD

### Documentation

TBD

### Assumptions

The Consolidated Shuttle Data Stream Gateway relies on the CCMS Common Data Buffer FIFO data stream to supply existing CCMS measurement data to the Consolidated Systems Gateway. This forces a dual build activity - one build for CCMS, and one build for CLCS.

Operational responsibilities for generation of the products will belong to USA LPS S/W Integration department.

User interface for CDS and SDC re-platformed components will be used to support and control use access to the software (i.e., access to CDS functions will be through the CCMS System Interface; access to SDC functions will be via HTML forms; access to DBSAFE functions will be through Oracle Forms).

Data Health functions do not required any special build products.

Fusion FD's will be restricted in this release to currently supported data types (e.g. analog, discrete, digital pattern).

No tables will be generated for Fusion FDs. Fusion FDs will be managed by the build software similar to how Pseudo FDs are presently managed.

FD information extracted from the CDS FD Directory must be converted to ASCII and then manually transferred to SDC via FTP.

DDVT files, Data Health Algorithms and Data Fusion Algorithms will be handled by the load software directly from the CM Respository. The load check capability for these files are a post-Redstone delivery.

### Open Issues

Little Endian to Big Endian conversions for SDC to CLCS - who is going to do this?

## 2.3 System Control Assessment

This CSCI will provide the capability to load and initialize a Test Build on Gateway, DDP, CCP and HCI platforms.

### OPS Configuration Manager Work Required

Implement the following high-level requirements:

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1. Provide the capability to retrieve test load software and TCID products from the AUSPEX.
2. Provide the capability to transfer test load software and TCID products to gateway, DDP, CCP and HCI platforms.
3. Provide a GUI to perform test load software transfers.
4. Provide status of these software transfers.
5. Provide the capability to manage/correlate test load software baselines and TCID baselines on a per platform basis.
6. Provide the capability to initialize system and test load software on gateway, DDP, CCP and HCI platforms via the System Services CSCI.
7. Provide a GUI to perform test load software initialization.
8. Provide API access to TCID descriptive information (e.g. TCID description, tail number, etc.).

### CSCI Assessment

CSC Name	CSCI Labor (EP)	% of CSCI	CSC EP
OPS Configuration Manager	24 manmonth		

### Lines of Code

The Redstone delivery will be based on modifications to the MCC OPS configuration management software delivery in JUNO. The Redstone modifications will consist of 4.8 KSLOC.

### Documentation

The following existing MCC documents will be updated as CLCS documents:

1. OPS Configuration Management API Manual
2. OPS Configuration Management Software User Handbook
3. OPS Configuration Management As-Built Subsystem Design Specification.

### Assumptions

1. The current system design requires that all system and test software be loaded on the the local disk of each platform. Run-timeNFS mounts are not desired.
2. The platform running the OPS configuration manager will have direct network connectivity to the gateway, DDP, CCP and HCI platforms requiring configuration.

### Open Issues

1. What requirements exist for providing OPS configuration management in the development environment?

## 2.4 Consolidated Systems Gateway Assessment

The Consolidated Systems Gateway delivered in Juno has a function that was developed to assign FDIDs to all the FDs that it processes. This function will not have to be performed by the Gateway in the Redstone.

### Function Name\_1 Work Required

TBD

### CSCI Assessment

Function Name	CSCI Labor (EP)	% of CSCI	Function EP

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**Lines of Code**

TBD

**Documentation**

TBD

**Assumptions**

The FDs will be supplied to the Consolidated Systems Gateway in a format compatible with CCMS-1 OLDB and be sorted by FDNAME.

**2.5 Data Retrieval Assessment**

An AP File will be created on SDC to allow for the retrieval of recorded CLCS FDs.

**FD Extractor and AP File Edit Work Required**

An AP File will be generated using existing software from the Function Designator Directory that exists on CDS. This file will be converted to ASCII with existing software and ported to the SDC. An FD Extractor will be written to obtain the GSE and Fusion FD information along the the FDID numbers for all the FDs from the CLCS FDD. An AP File edit function will be developed to add this new information to the existing AP File. Existing software will then be used to convert this file to SDC compatible format.

**CSCI Assessment**

Function Name	CSCI Labor (EP)	% of CSCI	Function EP
FD Extractor and AP File Edit	3 manmonths		

**Lines of Code**

TBD

**Documentation**

TBD

**Assumptions**

The AP File will contain 16 bit FDID addresses for this release. The number of FD support at this time should not cause the FDIDs to be assigned with a higher address than 16 bits will support.

The type of FDs supported in this release are limited to the current CCMS FD Types. No new FD types are being incorporated in this release.

**2.6 System Services Assessment****Initialization Services Work Required**

## Draft

- Provide an initialization service for CM use in the initialization of software processes in the DDP, CCP and HCI platforms.
- Support CM in startup of the initialization service and configuration.
- Provide the capability for a user to login on position/discipline basis.
- Provide the capability to logout one user and login another user without affecting the console operation.

### CSCI Assessment

CSC Name	CSCI Labor (EP)	% of CSCI	CSC EP
Initialization Service	6 manmonth	80%	.5

### Lines of Code

The Redstone delivery will be based on re-use of the MCC JUNO ported AutoPilot Services. No changes to this software are anticipated for Redstone.

### Documentation

The following existing MCC documents are available:

- MCC AutoPilot Services API Manual Vol. I
- MCC AutoPilot Services API Manual Vol. II, Software Users Guide
- MCC AutoPilot Services Subsystem Design Specification

### Assumptions

- AutoPilot will not be ported to the Gateway.
- CM will utilize a different initialization approach (other than the AutoPilot Services) for the Gateway

### Open Issues

- Need operational requirements/concepts for positional and user login/logout which will satisfy separation of TCIDs, security, safety, shift change, etc.

## 2.7 Simulation Gateway Assessment

The Simulation Gateway CSCI utilizes the Function Designator Directory as an input. If the data in the FDD changes, the Simulation Gateway functions will need to be modified to read the changed FDD.

### Function Name\_1 Work Required

TBD

### CSCI Assessment

Function Name	CSCI Labor (EP)	% of CSCI	Function EP
TBD			

# Draft

## Lines of Code

TBD

## Documentation

TBD

## Assumptions

None at this time.

## Open Issues

This assessment cannot be determined until the format of the FDD is established.

## 2.8 CLCS Development Environment Assessment

The CLCS Development Environment is responsible for supplying the CM Repository. It is assumed in this assessment that the new CM Repository will be able to tie user application files to a responsible system.

### Function Name\_1 Work Required

This is a list of work to be accomplished for this function.

### CSCI Assessment

Function Name	CSCI Labor (EP)	% of CSCI	Function EP
TBD			

## Lines of Code

TBD.

## Documentation

TBD

## Assumptions

None at this time.

## Open Issues

If the chosen tool for the CM Repository does not support this capability, this will need to be addressed.

## 3. COTS Products Dependencies

### **3.1 SW Products Dependency List**

Oracle Forms 4.0

Oracle7 Server Release 7.3

### **3.2 HW Products Dependency List**

N/A